

TECHNOLOGY

Tube Can Convert Heat Directly to Electricity

ELECTRICITY for future space vehicles may be produced directly from the heat of the sun or ordinary fuels by a new electronic tube.

The tube, known as a thermionic energy converter, has been made at the Radio Corporation of America Laboratories in Princeton, N. J., under a contract supported by the Advanced Research Projects Agency of the Department of Defense.

The device has been used in the laboratory to produce a watt of electricity. Future devices are expected to be capable of use as power generators in submarines, aircraft, missiles, space vehicles and perhaps the home and car.

The present device has an efficiency up to 14%.

The experimental tube was developed by Dr. Karl G. Hernqvist of RCA's technical staff. It is capable of generating either direct or alternating current at frequencies up to about 1,000,000 cycles per second, meaning that its power output could be suited to drive virtually all types of electrical equipment.

According to Dr. Hernqvist, such units could be fabricated in various forms and arrangements to produce whatever level of power might be required.

Science News Letter, July 23, 1960

MEDICINE

AHA Changes Smoking, Heart Disease Position

THE AMERICAN HEART ASSOCIATION has changed its stand on a link between smoking and heart disease from a 1957 statement of "not enough evidence" to one of "maybe." Taking the new position in the Journal of the American Medical Association, 173:1130, 1960, AHA says statistics showing that coronary heart disease death rates among middle-aged men are 50% to 150% higher among heavy smokers than among non-smokers do not prove smoking causes heart disease. But the data "strongly suggest" that heavy cigarette smoking may add to or speed up the onset of coronary heart disease, AHA says.

Science News Letter, July 23, 1960

TECHNOLOGY

Hydrofoil Ferry Begins Venice Service

AN ITALIAN FERRY, using a hydrofoil hull, is now in service between Venice and Trieste, across 80 miles of sea. The ferry, "Freccia dell' Adriatico," built by Leopoldo Rodriquez at Messina, is a new departure in fast passenger-carrying ships.

Operated by the Societa Aliscafi, the ferry runs twice daily in each direction. The vessel is equipped with a 1,500-horsepower Mercedes motor. The power developed is such that the ferry rises out of the water within a few yards of "take-off," then skims the surface on the hydrofoils at an

average speed of 40 to 45 knots, there being a clear space of about 24 inches between the hull and the surface of the water.

The ferry carries 76 passengers in aircraft-type seats, and covers each 80-mile trip in a scheduled two hours.

Although the new service has only been in operation for a few weeks, its success has already brought contracts for similar Italian-built hydrofoils for ferry services in Norway and Finland.

Science News Letter, July 23, 1960

PUBLIC HEALTH

Milk Still Best Food Despite Strontium-90

MILK IS STILL a most satisfactory protective food, regardless of concern about its strontium-90 content. In fact, Nutrition Reviews, 18:197, 1960, reports that milk actually protects against strontium-90 accumulation in the bone.

"The reports released by the U. S. Public Health Service of gradually increasing levels of strontium-90 in milk have led to increasing concern on the part of both professional and lay persons," the magazine says.

But a survey by Dr. Bruce L. Larson, assistant professor of biological chemistry, department of dairy science, University of Illinois, gives strong support to the claim that milk is still man's most satisfactory food, not only in terms of nutrition but in preventing strontium-90 accumulation in the bones of our population.

The survey is reported in the Journal of Dairy Science, 43:1, 1960, in which Dr. Larson says evidence now indicates that people in the "primary milk-consuming areas" are getting relatively lower levels of strontium-90 in their bones than people in the primary "plant-consuming areas." This is attributed to the high calcium level in milk.

Dr. Larson says in the Journal "it may be just as wise to increase milk consumption as to try to remove the strontium-90 from the milk."

Science News Letter, July 23, 1960

ZOOLOGY

Fish Mating Calls Have Local Twang

FEMALE FISHES produce mating sounds or calls that are characteristic not only of their species, but also of their geographic location. University of Texas graduate student E. A. Delco Jr. has reported that a male fish recognizes the call of a female of its own species and responds to it when given a choice between its own and another species.

This "isolation mechanism" may be one reason why different fish species do not usually interbreed. The regional accents were discovered by Mr. Delco in "red horse" shiners, a species of carp. He said those found in the Colorado River near Austin, Tex., have love songs that sound different from those of the same species 100 miles east in the Brazos River.

Science News Letter, July 23, 1960

IN SCIEN

ELECTRONICS

New Devices May Reduce Television's Cost, Size

A LITTLE RADIO made of two tiny new devices called "compactrons" sounds as good as a fair-sized table radio.

General Electric Company said the radio compared favorably with a five-tube radio, and surpassed a seven-transistor radio.

The compactron is a tiny, single unit that can perform electronic functions now done by as many as three separate electron-control devices. Company engineers said the device's multi-function operation and small size would help make color television less bulky and less expensive. Ten compactrons could replace 15 tubes and three diodes or 24 transistors and 11 diodes used in modern sets.

The compactrons, which look like conventional tubes, are now in pilot production at the GE electronic components plants in Owensboro, Ky.

Science News Letter, July 23, 1960

ROCKETS AND MISSILES

Pioneer V Model Plays "God Save the Queen"

A VERY EXACT five-inch model of the Pioneer V probe, silver in color, marks a program of British-American cooperation which permitted the establishment of a communication record of 22,500,000 miles. The model contains a musical box which, when wound up, plays the British national anthem, "God Save the Queen."

The musical model was presented by the National Aeronautics and Space Administration to Prof. Alfred C. B. Lovell, director of the Jodrell Bank Experimental Station just south of Manchester, England, after a meeting with President Eisenhower.

Jodrell Bank was in contact with Pioneer V for the first 22,500,000 miles of its trip round the sun. The only other radio telescope in contact with the probe was at South Point, Hawaii. It was only able to maintain good contact for the first five or six million miles.

The radio telescope at Jodrell Bank was originally built, mostly with British Government money, for the department of radio astronomy at the University of Manchester, but has recently played an important role in the tracking of both American and Russian satellites. It is, at present, the largest of its kind in the western world. Its bowl is movable and measures 250 feet in diameter.

In the future, however, the United States will not have to enlist outside aid in its space program. The Naval Research Laboratory has announced that it has under construction at Sugar Grove, W. Va., a 600-foot-diameter radio telescope.

Science News Letter, July 23, 1960

CE FIELDS

METALLURGY

Scientist Probes Alloy Behavior

THE DISTRIBUTION OF ELECTRONS in solid alloys consisting of one metal dissolved in another—a mystery whose unraveling might lead eventually to production of stronger metals—has puzzled scientists for years.

Dr. T. J. Rowland of the Metals Research Laboratories of Union Carbide Metals Company recently took an important step toward solving this mystery. He studied how closely the electrons that accompany solute atoms surround these atoms in solid solution. By observing the effect of the alloying on the nuclear resonance of copper, Dr. Rowland has been able to determine how these extra electrons are grouped around the solute atoms.

Nuclear resonance is the result of the absorption of energy by nuclei from a radio frequency electromagnetic field. The amount of energy absorbed at any particular frequency depends in turn upon the electron distribution. The resonance amplitude of copper undergoes a sharp reduction upon alloying. Its dependence upon solute valence and size argues decisively in favor of conduction electron charge redistribution as the dominant source of the electric field gradients surrounding these solutes.

Dr. Rowland's results, combined with a theory developed by W. Kohn and S. H. Vosko of Carnegie Institute of Technology, have shown that the electrons form a diffuse cloud around the solute atoms. The charge density in the cloud decreases about in proportion to the reciprocal cube of distance from the solute atom rather than exponentially; thus its effects are of longer range than had been supposed.

This work is part of a concerted study of various aspects of the fundamental structure of metallic solid solutions.

Science News Letter, July 23, 1960

MEDICINE

Chickenpox Can Kill Adults, Physician Warns

CHICKENPOX, usually a mild childhood disease, can kill adults. A Texas physician has just reported four deaths from chickenpox complications.

In the adults the disease became disseminated and the lungs were affected.

Dr. Stewart A. Fish of Dallas, reporting in the *Journal of the American Medical Association*, 173:76, 1960, says chickenpox, which is "usually a mild childhood disease, may cause severe systemic complications and death in adults."

He says the lungs are almost always involved and that other vital organs, including the brain, kidneys and liver, may be affected. The death rate has been esti-

mated at between 10% and 30% for patients with such disseminated chickenpox.

At present, there is no drug therapy available that will cure the disease or modify its course once the lungs and other viscera are involved.

Awareness of the danger is important, as early diagnosis may be a means of preventing dangerous complications.

The doctor makes a plea for earlier hospitalization of patients with disseminated chickenpox. His four patients were not hospitalized until they were desperately ill.

Dr. Fish says routine X-rays should be performed on all adult patients with chickenpox.

Science News Letter, July 23, 1960

ARCHAEOLOGY

Roman Ruins Cover Phoenician Remains

ARCHAEOLOGISTS have found the remains of an early Phoenician colony buried under the ruins of a monumental Roman city at Leptis Magna on the northern coast of Africa, 75 miles east of Tripoli in Libya.

Representatives of a University of Pennsylvania Museum expedition announced in Philadelphia that the group has found parts of walls of a public building and Greek pottery dating back to 600 B.C.

Phoenicians inhabiting what is now Lebanon established trading posts at places such as Carthage, Utica and Cadiz. Pressure from the Assyrians to the east forced the Phoenicians to expand their western Mediterranean trading posts into Punic colonies during the ninth and eighth centuries B.C.

Science News Letter, July 23, 1960

PUBLIC HEALTH

Radioactivity Reports To Be Made Public

PUBLIC REPORTS OF RADIOACTIVITY data collected in the vicinity of major Atomic Energy Commission installations will be made regularly, the AEC has announced. The initial group of reports, covering the first three months of 1960, will become available this month. Wider coverage and greater uniformity in methods of presenting the data are expected as the program develops.

Quarterly and annual summary reports of environmental radioactivity data will be provided by the Commission's contractors to the AEC area or operations offices. The operations offices will provide these reports and summaries to the Commission for transmittal to the U. S. Public Health Service. Copies of the reports also will be made available to interested groups or individuals on request.

The data are produced from routine monitoring programs around Commission plants and laboratories where operations are of such nature that plant perimeter radioactivity monitoring surveys are required. This monitoring is done in order to check controls and determine effect, if any, upon surrounding areas.

Science News Letter, July 23, 1960

AERONAUTICS

Planes to Broadcast Education Programs

TWO PLANES will be equipped to transmit television signals to a six-state Midwest area for the world's first airborne educational TV system.

The Midwest Council on Airborne Television Instruction awarded the \$2,200,000 contract for equipment to the Westinghouse Electric Corporation in Baltimore, Md. The program, scheduled to get under way on Jan. 30, 1961, will be beamed to Illinois, Indiana, Kentucky, Ohio, Michigan and Wisconsin.

Equipment for each plane will include two television transmitters capable of broadcasting signals to schools within a radius of 150 to 200 miles. When in service, a plane will circle at an altitude of 23,000 feet in the vicinity of the community of Montpelier in north central Indiana.

The transmitters will function as individual television stations in the air, broadcasting from two different channels or frequencies.

Science News Letter, July 23, 1960

ASTRONOMY

Call for Fallen "Stars" Issued by Smithsonian

A CALL FOR FALLEN "STARS," meteors that have survived their passage through the earth's atmosphere, has been issued by the Smithsonian Institution.

The meteorites are badly needed for a variety of scientific research problems, since these "rocks from space" are the only samples available on earth of extra-terrestrial material.

The Smithsonian has agreed to serve as a central agency for a continent-wide collecting program. It will investigate all reported falls, encourage active search for meteorites, inform interested scientists when new material is available, distribute samples for research and keep accurate records.

Any information concerning recent meteorite falls should be sent to Dr. F. L. Whipple, director of the Smithsonian Institution Astrophysical Observatory, Cambridge, Mass., or E. P. Henderson at the Smithsonian's National Museum in Washington.

It is hoped that the new program will increase the number of meteorite falls available for research from one per year to five or more falls per year.

Science News Letter, July 23, 1960

TECHNOLOGY

Temperatures of Furnace Hotter Than Sun's Surface

TEMPERATURES nearly three times that of the sun's surface can be produced by a furnace at the Naval Ordnance Laboratory, White Oak, Silver Spring, Md. The electric arc furnace is being tested for use in the study of new materials for rockets. Its electric arc can generate temperatures up to 27,000 degrees Fahrenheit.

Science News Letter, July 23, 1960